Name Key
Block____

Date_____
Units 1-5

Practice Test
Units 1-5

1. Given:
   $X = \{1, 2, 3, 4, 5\}$
   $Y = \{2, 4, 6\}$
   $Z = \{-2, 0, 2\}$
   What is the intersection of sets X, Y, and Z? $\{2\}$

2. What is the value of x in the equation $3(x - 1) = 2(2x + 3)$?

   $3x - 3 = 4x + 6$ $\quad -3 = x + 6$
   $-3x \quad -3x$ $\quad -6 \quad -6$
   $-3 = x + 6$ → NOT $\quad -9 = x$

3. Which relation is a function?
   (1) $\{(0, 1), (2, 3), (4, 5)\}$
   (2) $\{(1, 1), (2, 2), (3, 3)\}$
   (3) $\{(1, 1), (2, 1), (3, 1)\}$
   (4) $\{(1, 1), (1, 2), (1, 3)\}$ → Not a function if the x's repeat.

4. If x varies directly as y and x is 3 whaen y is 6, what is x when y is 40?

   → set up a proportion. $\frac{x}{y}$ $\quad \frac{3}{6} = \frac{x}{40}$ $\quad \frac{6x}{6} = \frac{120}{6}$ $\quad x = 20$

5. What is the value of the expression $(a^2 + b^0)^3$ when $a = -1$ and $b = 6$?

   $(-1^2 + 6^0)^3$ $\quad (1 + 1)^3$ $\quad 2^3$ $\quad 8$

6. Which value of x is the solution of the equation $\frac{1}{2}x + \frac{2}{3} = 12$?

   $\frac{1}{2}x + \frac{2}{3} = 12$ $\quad (2)\frac{1}{2}x = 11\frac{1}{3}(2)$
   $-\frac{2}{3} \quad -\frac{2}{3}$ $\quad x = 22\frac{2}{3}$

7. Which equation illustrates the distributive property?
   (1) $x + y + z = x + y + z$
   (2) $x(y + z) = xy + xz$
   (3) $x + y + z = z + y + x$
   (4) $(x + y) + z = x + (y + z)$

8. Which interval notation represents the set of all real numbers greater than or equal to 6 and less than 10?
   (1) (6, 10) $\quad$ (3) [6, 10)
   (2) (6, 10] $\quad$ (4) [6, 10]

   [ ] ↑ # included in the set

   [6, 10)

   ( ) ↑ #'s not included

9. What is the slope of the line whose equation is $5x + 5y = 15$?

$5x+5y=15$, $-5x \quad -5x$, $\frac{5y}{5} = \frac{-5x-15}{5}$

$m = -1$

10. If $\frac{ab}{c} + d = e$, what is a in terms of b, c, d, and e?

$\frac{ab}{c} + d = e - d$, $\frac{ab}{b} = (e-d)c$, $a = \frac{(e-d)c}{b}$

$y = -1x - 3$

11. Kate and Maria work at a concession stand. They each earn $9 per hour. Kate worked two hours more than Maria. If Kate and Maria earned a total of $72, how many hours did Kate work?

Let x = Maria

Let $x+2$ = Kate

$9(x) + 9(x+2) = 72$

$9x + 9x + 18 = 72$

$18x + 18 = 72$, $-18 \quad -18$, $\frac{18x}{18} = \frac{54}{18}$

Maria: $x = 3$, so $x+2 = 3+2 = 5$ (Kate)

12. If the universal set is {red, orange, yellow, green}, what is the complement of the set {Green}?

{red, orange, yellow}

13. A doughnut shop charges $0.70 for each doughnut and $0.30 for a carryout box. Shirley has $5.00 to spend. She needs to determine the *most* doughnuts (x) she can buy when she only puts them in one carryout box.

Let x = # of doughnuts

$.70x + .30 \leq 5$, $-.3 \quad -.30$, $\frac{.7x}{.7} \leq \frac{4.7}{.7}$

$x \leq 6.7$

She can buy 6 doughnuts

14. Write the equation of the line through point (-1, 1) with a slope of 1.

$y = mx + b$ $(-1, 1)$ $m = 1$ $1 = -1(1) + b$ $1 = -1 + b$, $+1 \quad +1$, $b = 2$

$y = 1x + 2$

15. Write an algebraic expression to represent 10 less than twice x?

$2x - 10$

16. What is the value of the expression $4x^2y - 2x$ when $x = -3$ and $y = 5$?

$4(-3)^2(5) - 2(-3)$

$4(9)(5) + 6$

$180 + 6$

186

17. The data in the table below are graphed, and the slope is examined.

x	y
0	5
1	10
2	15

$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{10-5}{1-0} = \frac{5}{1} = 5$

The rate of change represented in this table can be described as

(1) negative (3) undefined

(2) positive (4) zero

18. In interval notation, the set of all real numbers greater than or equal to -1 and less than 10 is represented by

(1) $(-1, 10)$ (3) $(-1, 10]$

(2) $[-1, 10)$ (4) $[-1, 10]$

$[-1, 10)$

Vocab:

Inequality - has $<, \geq, <, >$

Expression - does NOT have an equal sign!

Equation - has an = sign

19. An example of an algebraic expression is

(1) $M = rise/run$ (3) $2x(x-1) \leq 18$

(2) $2x + 3y - z$ (4) $22x - 5 = 25+3x$

20. What is the solution of the inequality $6 + 2x \leq 12 + 8x - 3x$

$6 + 2x \leq 12 + 8x - 3$

$6 + 2x \leq 9 + 8x$

$6 + 2x \leq 9 + 8x$

$-2x \quad -2x$

$6 \leq 9 + 6x$

$-3 \leq 6x$

$\frac{-3}{6} \leq \frac{6x}{6}$

$-\frac{1}{2} \leq x$ so $x \geq -\frac{1}{2}$

21. Jack wants to replace the flooring in his rectangular kitchen. He calculates the area of the floor to be 24 square meters. The actual area of the floor is 26.5 square meters. What is the relative error in calculating the area of the floor, to the *nearest thousandth*?

$R.E = \frac{Error}{Actual}$ $R.E = \frac{26.5 - 24}{26.5} = \frac{2.5}{26.5} = 0.\underline{943}\underline{3}9$

0.943

22. What is the slope of the line passing through the points $(-1,2)$ and $(3,5)$?

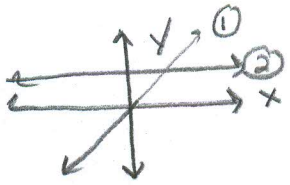
x_1, y_1 x_2, y_2

$m = \frac{y_2 - y_1}{x_2 - x_1}$ $m = \frac{5-2}{3-(-1)}$ $m = \frac{3}{4}$

23. Which equation represents a line parallel to the x-axis?

(1) $y = x$ (3) $x = -y$

(2) $y = 1$ (4) $x = -3$



24. A hiker walked 10 miles from 10:00 a.m. to noon. He walked an additional 16 miles from 1:00 p.m. to 3:00 p.m. What is his average rate for the entire walk, in miles per hour?

$\frac{26 \text{ miles}}{4 \text{ hours}} = \frac{26}{4} =$ 6.5 mph

25. Which verbal expression can be represented by $6(x + 1)$?

(1) 1 more than 6 times x

(2) 6 multiplied by x plus 1

(3) 6 times the sum of x and 1

(4) the product of 6 and x, increased by 1

26. Given: $A = \{5, 7, 9, 11\}$

$B = \{3, 4, 5, 6, 7\}$

What is the union of sets A and B?

Union - everything in both sets

$A \cup B = \{3, 4, 5, 6, 7, 9, 11\}$

27. Which equation represents a line that is parallel to the line $y = 2 - x$?

(1) $3x + y = 5$ (3) $y = -x$

(2) $2x + 6y = 1$ (4) $y = x - 2$

parallel: SAME SLOPE

$y = -x + 2$

so $m = -1$